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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
1742	26

DATE MAILED: 05/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/465,492	SEGAL ET AL.	
	Examiner	Art Unit	
	Harry D Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 45-74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 45-74* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *23,25* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-3 and 45-72 are pending.

2. The rejections under 35 U.S.C. 103 based on the Dunlop et al reference have been withdrawn in view of Applicant's amendment of the claimed subject matter regarding the precipitates, namely that the claim now requires a total absence of precipitates, whereas the previous claim allowed for a few to be present.

3. The new grounds of rejection are as follows.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 45-49, 51, 52, 54-60, 73, 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawazoe et al (US 5,826,456) in view of Dunlop et al (US 5,590,389), Kobayashi et al (US 5,722,165) and "Heat Treating of Aluminum Alloys".

Kawazoe et al teach (see col. 13, line 52 to col. 14, line 9) a cast aluminum alloy material that has crystal grain sizes in the range of 0.05 to 0.6 microns (thus meeting characteristic d).

Kawazoe et al does not teach that the material is a sputtering target, has a substantially homogenous composition, has a substantial absence of casting defects, an absence of detectable precipitates, and a substantially uniform structure and texture.

Regarding the fact that the material is a sputtering target, Dunlop et al teach (see abstract) that ultrafine grain size aluminum alloys were made into sputtering targets by ECAE (equal channel angular extrusion). Therefore, it would have been obvious to one of ordinary skill in the art to have made the material of Kawazoe et al into a sputtering target because it provides an aluminum alloy material made by ECAE with an ultrafine grain size which would be useful as a sputtering target.

Regarding the characteristic that the material has a substantial absence of casting defects, Kobayashi et al teach (see col. 2, lines 51-59) that casting defects in aluminum alloys can be removed by applying hot forging. The removal of casting defects prevents cracking of the alloy during use. Therefore, it would have been obvious to have applied a hot forging as taught by Kobayashi et al to achieve an aluminum alloy sputtering target with a substantial absence of casting defects.

Regarding the characteristic that the material has an absence of detectable precipitates, "Heat Treating of Aluminum Alloys" teaches (see page 844) applying a step of solutionizing to an aluminum alloy in order to dissolve any precipitates present in the alloy. Therefore, it would have been obvious to one of ordinary skill in the art to have applied the solutionizing as taught by "Heat Treating of Aluminum Alloys" to the aluminum material of Kawazoe et al because the solutionizing step makes the precipitates in the alloy dissolve back into the solid solution.

Regarding the limitations that the sputtering target has a homogenous composition and uniform structure and texture, Kawazoe et al teach (see col. 9, lines 25-30) that the ECAE was able to create a homogenizing effect, thus producing a

homogenous composition. Because the ECAE method of Kawazoe et al is substantially identical to the ECAE method of the present invention (multiple passes, with rotation of material between each pass) one of ordinary skill in the art would have expected that the material of Kawazoe et al would have the uniform structure and texture as claimed.

Regarding claims 2 and 45-48, Kawazoe et al teach (see col. 10) an aluminum alloy material, A6063, which contains Al, Ti and Cu.

Regarding claim 3, Kawazoe et al teach a method of treating an aluminum alloy and teach (through example) that the method is applicable to many aluminum alloys. Dunlop et al teach (see col. 8, lines 3-10) making a sputtering target from an Al-0.5 wt% Cu alloy. Therefore, it would have been obvious to have applied the method of Kawazoe et al to the composition of Dunlop et al because the method of Kawazoe et al produces ultrafine grain sizes and high strength.

Regarding claims 49, 51, 52 and 54, Kawazoe et al teach a method of treating an aluminum alloy and teach (through example) that the method is applicable to many alloys. Dunlop et al teach (see col. 4 lines 10-14) making a sputtering target from Pt, Au, Ta or Mo. Therefore, it would have been obvious to have applied the method of Kawazoe et al to the composition of Dunlop et al because the method of Kawazoe et al produces ultrafine grain sizes and high strength.

Regarding claims 55, 73 and 74, Kawazoe et al teach (see Tables 2 and 4) that after the ECAE the alloy has a tensile strength of 250-350 MPa. See above regarding casting defects and grain size. Though there is no express disclosure of the yield strength of the material, because the method of producing taught by Kawazoe et al is

substantially identical to the ECAE method of the present invention (multiple passes, with rotation of material between each pass) one of ordinary skill in the art would have expected that the material of Kawazoe et al would have the yield strength as claimed.

Regarding claims 56, 57, Kawazoe et al teach (see col. 10) an aluminum alloy material, A6063, which contains Al, Ti and Cu.

Regarding claims 58-60, see discussions above regarding absence of precipitates, uniform structure and texture and homogenous composition.

6. Claims 50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawazoe et al (US 5,826,456) in view of Dunlop et al (US 5,590,389), Kobayashi et al (US 5,722,165) and "Heat Treating of Aluminum Alloys" as applied to claim 1 and further in view of Drauglis et al (US 4,374,717).

As cited above, Kawazoe et al in view of Dunlop et al, Kobayashi et al and "Heat Treating of Aluminum Alloys" do not teach or suggest a sputtering target that comprises nickel or silver.

Drauglis et al teach (see col 3, lines 14-26) that sputtering targets which include nickel or silver are known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to have made the nickel or silver containing sputtering targets of Drauglis et al by the process disclosed by Kawazoe et al because the process of Kawazoe et al provides a sputtering target with ultrafine grain size and high strength.

7. Claims 61-63 and 66-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawazoe et al (US 5,826,456) in view of Dunlop et al (US

5,590,389), Kobayashi et al (US 5,722,165) and "Heat Treating of Aluminum Alloys" and further in view of Takahashi et al (EP 0,882,813).

As described above, Kawazoe et al in view of Dunlop et al, Kobayashi et al and "Heat Treating of Aluminum Alloys" do not teach a sputtering target made from a copper alloy

Takahashi et al teach (see abstract) a sputtering target that comprises copper. Takahashi et al teach that the copper sputtering target is used for forming a deposition film with low electric resistance.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the method of Kawazoe et al (in view of Dunlop et al, Kobayashi et al and "Heat Treating of Aluminum Alloys") to make the sputtering target of Takahashi et al because the method of Kawazoe et al produces a sputtering target with ultrafine grain size and high strength.

Regarding claims 62 and 63, Takahashi et al teach (see abstract) that the alloy contains at most 1 ppm Al. Thus, Takahashi et al teach a sputtering target that comprises Al.

Regarding claim 66, Kawazoe et al teach (see Example 3) starting from a cast material.

Regarding claim 67, Takahashi et al teach that the target is made from high purity copper.

Regarding claims 68 and 69, Takahashi et al teach (see abstract) that the alloy contains up to 1 ppm Al.

Regarding claim 70-72, see paragraph above regarding the characteristics that the alloy has homogenous composition, an absence of precipitates and a uniform structure and texture.

8. Claims 61- 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawazoe et al (US 5,826,456) in view of Dunlop et al (US 5,590,389), Kobayashi et al (US 5,722,165) and "Heat Treating of Aluminum Alloys" in view of Siewert et al (US 4,466,940).

As described above, Kawazoe et al in view of Dunlop et al, Kobayashi et al and "Heat Treating of Aluminum Alloys" do not teach a sputtering target made from a copper alloy

Siewert et al teach (see abstract) an alloy for targets employed in sputtering that contains (see col 2, lines 5-12) gold, aluminum and the balance copper.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the method of Kawazoe et al to make the sputtering target of Siewert et al because the method of Kawazoe et al produces a sputtering target with ultrafin grain size and high strength.

Regarding claims 62-64, Siewert et al teach (see col 2, lines 5-12) that the alloy contains aluminum and gold.

9. Claims 61, 62 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawazoe et al (US 5,826,456) in view of Dunlop et al (US 5,590,389), Kobayashi et al (US 5,722,165) and "Heat Treating of Aluminum Alloys" in view of Nalepka et al (US 4,883,721).

As described above, Kawazoe et al in view of Dunlop et al, Kobayashi et al and "Heat Treating of Aluminum Alloys" do not teach a sputtering target made from a copper alloy

Nalepka et al teach (see abstract) a multilayer thin film produced by sputtering. Nalepka et al teach (see col 6, lines 11-16) an alloy for targets employed in sputtering the second layer that contains silver and 5-10 wt% copper.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the method of Kawazoe et al to make the sputtering target of Nalepka et al because the method of Kawazoe et al produces a sputtering target with ultrafine grain size and high strength.

Regarding claims 62 and 65, Nalepka et al teach (see col 6, lines 11-16) that the alloy contains copper and silver.

Response to Arguments

10. Applicant's arguments with respect to claims 1-3 and 45-72 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 6:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III
Examiner
Art Unit 1742

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

hdw
May 8, 2003